

The Need to Control Hazardous Energy

General industry uses electrical, mechanical, hydraulic, pneumatic, chemical, thermal and other energy types to power machines. Energized machinery makes possible the advantages of our modern culture. Unless the energy is controlled, however, it also poses serious hazards to employees.

Uncontrolled energy is a hazard to operators and other employees in the area of the machinery, equipment or processes. Those who service and maintain machinery or equipment are especially vulnerable because it might become energized while being serviced.

No detailed national data are available on the number of workers killed each year by contact with uncontrolled hazardous energy. However, during the period 1982-1997, NIOSH investigated 1,281 fatal incidents as part of its Fatality Assessment and Control Evaluation program. Of these, 152 involved installation, maintenance, service or repair tasks on or near machines, equipment, processes or systems. Because the FACE program was active in only 20 states between 1982 and 1997, these fatalities represent only a portion of the U.S. workers who were killed by contact with uncontrolled hazardous energy.

According to OSHA, approximately 39 million workers are protected by this rule. (The 3 million workers who actually service equipment—i.e., craft workers, machine operators, and laborers—face the greatest risk). OSHA estimates that compliance with the standard prevents about 122 fatalities, 28,400 lost workday injuries and 31,900 non-lost workday injuries each year.

OSHA estimates that adherence to the requirements of this standard can eliminate nearly 2 percent of all workplace deaths in establishments affected by this rule and can have a significant impact on worker safety and health in the United States.

Scope and Application

The lockout/tagout standard applies to general industry employment and covers the servicing and maintenance of machines and equipment in which the unexpected startup or the release of stored energy could cause injury to employees. The standard applies to any source of mechanical, hydraulic, pneumatic, chemical, thermal or other energy, but does not cover electrical hazards. Subpart S of 29 CFR Part 1910 covers electrical hazards, and 29 CFR Part 1910.333 contains specific lockout/tagout provisions for electrical hazards. (If employees are performing service or maintenance tasks that do not expose them to the unexpected startup of machines or equipment, energization, or release of hazardous energy, the standard does not apply.)

The standard establishes minimum performance requirements for the control of hazardous energy. The standard does not apply in the following situations:

- While servicing or maintaining cord and plug connected electrical equipment, provided that the equipment is unplugged from the energy source and the plug remains under the exclusive control of the employee performing the servicing and/or maintenance; and
- During hot tap operations that involve transmission and distribution systems for gas, steam, water or petroleum products when they are performed on pressurized pipelines provided that continuity of service is essential, shutdown of the system is impractical, and employees are provided with alternative protection that is equally effective.

Forms of Hazardous Energy

Workers may be exposed to hazardous energy in several forms and combinations during installation, maintenance, service or repair work. A comprehensive hazardous energy control program should address all forms of hazardous energy [NIOSH 1983]:

- ***Kinetic (mechanical) energy*** in the moving parts of mechanical systems